

CLAIMS

What is claimed is:

- 1 1. A method of providing sets of network addresses for dynamically configuring hosts
2 on a network, the method comprising the computer-implemented steps of:
3 sending a first request for a first count of network addresses for a first set of network
4 addresses for dynamically configuring hosts on the network;
5 receiving a first message indicating the first set of network addresses;
6 receiving a second message requesting a second count of network addresses for a
7 second set of network addresses for dynamically configuring hosts on the
8 network;
9 determining the second set of network addresses based at least in part on the first set
10 of network addresses and the second count; and
11 sending a first response indicating the second set of network addresses.
- 1 2. A method as recited in Claim 1, further comprising:
2 receiving, from a first host on the network, a third message requesting a network
3 address; and
4 sending, to the first host in response to the second message, a second response
5 offering a first network address based on the first set of network addresses and
6 the second set of network addresses.
- 1 3. A method as recited in Claim 2, wherein the first set includes the first network
2 address and the second set does not include the first network address.
- 1 4. A method as recited in Claim 1, further comprising receiving from a network
2 administrator a third message indicating a third set of network addresses for dynamically
3 configuring hosts on the network.

1 5. A method as recited in Claim 1, further comprising determining usage of the first set
2 of network addresses.

1 6. A method as recited in Claim 5, further comprising reporting the usage of the first set
2 of network addresses.

1 7. A method as recited in Claim 5, said step of determining the second set of network
2 addresses is further based at least in part on the usage of the first set of network addresses.

1 8. A method as recited in Claim 5, wherein:
2 the first message further indicates a first time interval for use of the first set; and
3 the method further comprises sending, before the first time interval expires, a second
4 request for renewal of use of the first set; and
5 the second request includes data indicating the usage of the first set.

1 9. A method as recited in Claim 1 further comprising the computer-implemented steps
2 of:
3 receiving a third message for renewal of use of the second set, the third message
4 including data indicating the usage of the second set,
5 determining a third set of network addresses for dynamically configuring hosts on the
6 network based on the second set and the usage of the second set; and
7 sending a second response indicating the second set of network addresses.

1 10. A method as recited in Claim 1, wherein each set of the first set and the second set is
2 indicated by a base address and a number indicating a range of addresses above the base
3 address.

1 11. A method as recited in Claim 10, wherein the number indicating the range is a mask
2 that indicates a number of most significant bits in the base address that are constant over the
3 range.

1 12. A method as recited in Claim 1, wherein the second set is empty.

1 13. A method as recited in Claim 1, wherein the second set is the same as the first set.

1 14. A method as recited in Claim 1, wherein the hosts on the network include interfaces
2 on a router on the network.

1 15. A method as recited in Claim 1, further comprising:
2 receiving, from a router on the network, a third message requesting a third count of
3 network addresses for a third set of network addresses for configuring
4 interfaces on the router;
5 determining the third set of network addresses based at least in part on the first set of
6 network addresses, the second set of network addresses, and the third count;
7 and
8 sending, to the router in response to the third message, a second response indicating
9 the third set of network addresses.

1 16. A method as recited in Claim 1, wherein:
2 the first message received includes data indicating that a first server should send a
3 third set of network addresses for dynamically configuring hosts on the
4 network; and
5 the method further comprises sending, in response to the data indicating that the first
6 server should send the third set, a second request for the third set of network
7 addresses.

1 17. A method as recited in Claim 16, further comprising receiving, from the first server in
2 response to the second request, a third message indicating the third set of network addresses.

1 18. A method as recited in Claim 1, further comprising:
2 determining that a third set of network addresses should be sent based at least in part
3 on the first set and the second set; and
4 inserting into the first response data indicating that a third set of network addresses
5 for dynamically configuring hosts on the network should be sent.

1 19. A method as recited in Claim 18, wherein:
2 the method further comprises determining usage of the first set of network addresses;
3 and
4 said step of determining that a third set of network addresses should be sent is based
5 at least in part on the usage of the first set.

1 20. A method as recited in Claim 18, further comprising receiving, in response to the data
2 indicating that the third set of network addresses should be sent, a third message requesting
3 the third set of network addresses.

21. A method of providing sets of network addresses for dynamically configuring hosts on a network, the method comprising the computer-implemented steps of:

- receiving, from a first server on the network, a first message indicating a first set of network addresses for dynamically configuring hosts on the network and a first time interval for use of the first set;
- determining usage of the first set of network addresses; and
- sending, to the first server before the first time interval expires, a second request for renewal of use of the first set,

wherein the second request includes data indicating the usage of the first set.

22. A method of providing sets of network addresses for dynamically configuring hosts on a network, the method comprising the computer-implemented steps of:

- sending, to a first server on the network, a first message indicating a first set of network addresses for dynamically configuring hosts on the network and a first time interval for use of the first set;
- receiving, from the first server before the first time interval expires, a request for renewal of use of the first set, the request including data indicating the usage of the first set,
- determining a second set of network addresses for dynamically configuring hosts on the network based on the first set and the usage of the first set; and
- sending to the first server a second message indicating the second set of network addresses.

23. A method of providing sets of network addresses for dynamically configuring hosts on a network, the method comprising the computer-implemented steps of:

- sending, to a first server, a first request for a first count of network addresses for a first set of network addresses for dynamically configuring hosts on the network;
- receiving, from the first server in response to the first request, a first message including first data indicating the first set of network addresses and second data indicating that the first server should send a second set of network addresses for dynamically configuring hosts on the network; and
- sending, to the first server in response to the data indicating that the first server should send the second set, a second request for the second set of network addresses.

24. A method of providing sets of network addresses for dynamically configuring hosts on a network, the method comprising the computer-implemented steps of:

- receiving, from a first server, a first request for a first count of network addresses for a first set of network addresses for dynamically configuring hosts on the network;
- determining usage of a second set of network addresses for dynamically configuring hosts on the network;
- determining the first set of network addresses based at least in part on the first count and the usage of the second set;
- determining a third set of network addresses for dynamically configuring hosts on the network based at least in part on the first set and the usage of the second set; and
- sending, to the first server in response to the first request, a first message including first data indicating the first set of network addresses and second data indicating that a third set of network addresses should be sent.

25. A computer-readable medium carrying one or more sequences of instructions for providing sets of network addresses for dynamically configuring hosts on a network, which instructions, when executed by one or more processors, cause the one or more processors to carry out the steps of:

- sending a first request for a first count of network addresses for a first set of network addresses for dynamically configuring hosts on the network;
- receiving, in response to the first request, a first message indicating the first set of network addresses;
- receiving a second message requesting a second count of network addresses for a second set of network addresses for dynamically configuring hosts on the network;
- determining the second set of network addresses based at least in part on the first set of network addresses and the second count; and

14 sending, in response to the second message, a first response indicating the second set
15 of network addresses.

1 26. An apparatus for providing sets of network addresses for dynamically configuring
2 hosts on a network, comprising:
3 means for sending a first request for a first count of network addresses for a first set
4 of network addresses for dynamically configuring hosts on the network;
5 means for receiving, in response to the first request, a first message indicating the first
6 set of network addresses;
7 means for receiving a second message requesting a second count of network
8 addresses for a second set of network addresses for dynamically configuring
9 hosts on the network;
10 means for determining the second set of network addresses based at least in part on
11 the first set of network addresses and the second count; and
12 means for sending, in response to the second message, a first response indicating the
13 second set of network addresses

1 27. An apparatus for providing sets of network addresses for dynamically configuring
2 hosts on a network, comprising:
3 a network interface that is coupled to the network for sending and receiving one or
4 more packet flows therefrom;
5 a processor; and
6 one or more stored sequences of instructions which, when executed by the processor,
7 cause the processor to carry out the steps of:
8 sending a first request for a first count of network addresses for a first set of
9 network addresses for dynamically configuring hosts on the network;
10 receiving, in response to the first request, a first message indicating the first
11 set of network addresses;

12 receiving a second message requesting a second count of network addresses
 13 for a second set of network addresses for dynamically configuring
 14 hosts on the network;
 15 determining the second set of network addresses based at least in part on the
 16 first set of network addresses and the second count; and
 17 sending, in response to the second message, a first response indicating the
 18 second set of network addresses.

1 28. A method as recited in Claim 1, wherein the second message includes data indicating
 2 that a requesting device that issued the second message does not make assignments of
 3 individual network addresses from among the second set of network addresses such
 4 that all future requests for such assignments will be relayed back.

1 29. A method as recited in Claim 1, wherein the second message includes data indicating
 2 that a requesting DHCP server should free the second set of network addresses as
 3 soon as possible by making no new assignments of addresses or subnets therefrom.

1 30. A method as recited in Claim 1, wherein the second message includes data indicating
 2 that a requesting DHCP server should discontinue use of the second set of network
 3 addresses when all addresses in the subnet are unassigned.

1 31. A method of providing subnets of network addresses for dynamically configuring
 2 hosts on a network using the dynamic host control protocol (DHCP), the method
 3 comprising the computer-implemented steps of:
 4 sending a first DHCP request for a first count of network addresses for a first subnet
 5 of network addresses for dynamically configuring hosts on the network;
 6 receiving a first DHCP message indicating the first subnet;
 7 receiving a second DHCP message requesting a second count of network addresses
 8 for a second subnet of network addresses for dynamically configuring hosts
 9 on the network;

- 10 determining the second subnet based at least in part on the first set of network
- 11 addresses, the second count, and a pool of available subnets; and
- 12 sending a first DHCP response indicating the second subnet.
- 13